

WHAT IS CLAIMED IS:

1. A light-emitting semiconductor device, comprising:

at least two terminals;

at least one LED die, and each comprising two electrode contacts;

5 a driver IC chip comprising a contact and at least one output port;

a substrate attached beneath said LED die and said driver IC chip;

and

a refractive encapsulation material for integrally encapsulating and protecting said LED die and said driver IC chip;

10 wherein:

one of said electrode contacts of each LED die is connected to the respective output port of said driver IC chip;

another electrode contact of each LED die is connected to one of said terminals of said light-emitting semiconductor device;

15 said contact of said driver IC chip is connected to another terminal of said light-emitting semiconductor device;

said LED die is lit by applying voltage or current to said terminals of said light-emitting semiconductor device and passing through said driver IC chip; and

20 said light-emitting semiconductor device is attached on an application circuit board by adhering said terminals thereon with surface-mount technology.

2. The light-emitting semiconductor device as claimed in claim 1, wherein said driver IC chip is a current-driving IC chip and outputs a current
25 to said LED die.

3. The light-emitting semiconductor device as claimed in claim 2, wherein said driver IC chip outputs a constant current unaffected by deviation of forward voltage of said LED die so as to precisely control

brightness of said LED die.

4. A light-emitting semiconductor device, comprising:
 - at least three terminals;
 - at least one LED die, and each comprising two electrode contacts;
 - 5 a driver IC chip comprising at least two contacts and at least one output port;
 - a substrate attached beneath said LED die and said driver IC chip;
 - and
 - a refractive encapsulation material for integrally encapsulating and
 - 10 protecting said LED die and said driver IC chip;
 - wherein:
 - one of said electrode contacts of each LED die is connected to the respective output port of said driver IC chip by an electrically conducting means;
 - 15 another electrode contact of each LED die is connected to one of said terminals of said light-emitting semiconductor device;
 - two contacts of said driver IC chip are respectively connected to another two terminals of said light-emitting semiconductor device, and one of said terminals provides a voltage or current for controlling output of said
 - 20 driver IC chip;
 - said LED die is lit by applying voltage or current to said terminals of said light-emitting semiconductor device and passing through said driver IC chip; and
 - said light-emitting semiconductor device is attached on an
 - 25 application circuit board by adhering said terminals thereon with surface-mount technology or through-hole technology.
5. The light-emitting semiconductor device as claimed in claim 4, wherein said driver IC chip is a current-driving IC chip and outputs a current

to said LED die.

6. The light-emitting semiconductor device as claimed in claim 5,
wherein said driver IC chip outputs a constant current unaffected by
deviation of forward voltage of said LED die so as to precisely control
5 brightness of said LED die.